State: UTTAR PRADESH

Agriculture Contingency Plan for District: SONBHADRA

1.0 District Agriculture profile				
1.1	**Agro-Climatic/Ecological Zone**			
	Agro Ecological Sub Region (ICAR)	Moderately To Gently Sloping Chattisgarh Mahanadi Basin, Hot Moist/Dry Subhumid Transitional ESR With Deep Loamy To Clayey Red And Yellow Soils (11.0)		
	Agro-Climatic Zone (Planning Commission)	Middle Gangetic Plain Region (IV)		
	Agro Climatic Zone (NARP)	Vidhyan Zone (UP-10)		
	List all the districts falling under the NARP Zone* (*>50% area falling in the zone)	Allahabad, Ballia , Chandauli, Ghazipur, Jaunpur , Mirzapur , Sant Ravidas Nagar , Sonbhadra , Varanasi		
	Geographic coordinates of district headquarters	Latitude	Longitute	Altitude
		24°67' N	83° 06' E	283
	Name and address of the concerned ZRS/ ZARS/ RARS/ RRS/ RRTTS	Institute of Agricultural Sciences, Banaras Hindu University Vanarasi		
	Mention the KVK located in the district with address	KVK Located at Tissuhi PO Marehan, Sonbhadra - 231310		
	Name and address of the nearest Agromet Field Unit (AMFU, IMD) for agro-advisories in the Zone	Agro-met-unit Robertsganj, Sonbhadra		

1.2	**Rainfall**	**Normal RF(mm)**	**Normal Rainy days (number)**	**Normal Onset**	**Normal Cessation**
	SW monsoon (June-Sep)	944.9	38	3rd week of June	1st week of October
	NE Monsoon(Oct-Dec)	59.1	2		
	Winter (Jan- March)	60.4	4	-	-
	Summer (Apr-May)	16.7	2	-	-
	Annual	1081.1	46	-	-

1.3	**Land use pattern of the district**	Geographical Area	Cultivable area	Forest area	Land under non-agricultural use	Permanent pastures	Cultivable wasteland	Land under Misc. tree crops and groves	Barren and uncultivable land	Current fallows	Other fallows
	Area ('000 ha) (2007-08)	680.961	138.815	333.009	50.458	0.242	11.384	55.951	10.907	64.337	15.858

1. 4	**Major Soils**	**Area ('000 ha)**	**Percent (%) of total geographical area**
	Black Soil	-	-
	Sandy Loam	-	-
	Red Lateritic Soil	-	-
	Red Soil	-	-

Data source: Soil Resource Maps of NBSS & LUP

1.5	**Agricultural land use**	Area ('000 ha)	Cropping intensity %
	Net sown area	138.815	126
	Area sown more than once	36.816	
	Gross cropped area	175.631	

1.6	Irrigation	Area ('000 ha)		
	Net irrigated area	27.983		
	Gross irrigated area	33.229		
	Rainfed area	110.832		
	Sources of Irrigation	**Number**	**Area ('000 ha)**	**Percentage of total irrigated area**
	Canals	511	25.025	89.43
	Tanks	-	0.560	2.00
	Open wells	9245	1.892	6.76
	Bore wells	97	Govt0.0 + Pvt. 0.100	0.36
	Lift irrigation schemes			0
	Micro-irrigation			
	Other sources (please specify)	309	0.406	1.45
	Total Irrigated Area		27.983	
	Pump sets			
	No. of Tractors			
	Groundwater availability and use* (Data source: State/Central Ground water Department /Board)	**No. of blocks/ Tehsils** (8 Blocks)	**(%) area**	**Quality of water**
	Over exploited			
	Critical			
	Semi- critical	1/12 (Rajgarh)		
	Safe	11 /12		
	Wastewater availability and use	1032 MCM/YR		
	Ground water quality	Safe		Safe
*over-exploited: groundwater utilization > 100%; critical: 90-100%; semi-critical: 70-90%; safe: <70%				

1.7 Area under major field crops & horticulture (Year: 2007-08)

Major field crops cultivated	Area ('000 ha)							
	Kharif			*Rabi*				
	Irrigated	**Rainfed**	**Total**	**Irrigated**	**Rainfed**	**Total**	**Summer**	**Grand total**
Rice	9.515	21.376	30.891	-	-	-	-	30.891

Maize	-	15.028	15.028	-	-	-	0.124	15.152
Pigeonpea	-	11.717	11.717	-	-	-	-	11.717
Wheat	-	-	-	21.532	28.583	50.115	-	50.115
Chickpea	-	-	-	0.049	11.124	11.173	-	11.173
Barley	-	-	-	0.080	10.595	10.675	-	10.675
Lentil	-	-	-	0.0	9.346	9.346	-	9.346

	Horticulture crops – Fruits	**Area ('000 ha)**		
		Total	**Irrigated**	**Rainfed**
	Mango	0.230	-	-
	Guava	0.320	-	-
	Horticulture crops - Vegetables			
	Potato	1.100	1.100	-
	Vegetable Pea	0.680	0.680	
	Onion	0.511	0.505	0.006
	Tomato	0.630	-	0.630
	Cauliflower	0.320	0.320	
	Okra	0.430	-	0.430
	Medicinal and Aromatic crops	-	-	-
	Plantation crops	-	-	-
	Fodder crops	-	-	-
	Total fodder crop	0.299	0.258	0.041

	Grazing land	-	-	-
	Sericulture etc	-	-	-
	Others (specify)	-	-	-

1.8	**Livestock (Year 2003)**	**Male ('000)**	**Female ('000)**	**M+F Below three year**	**Total ('000)**
	Non descriptive Cattle (local low yielding)	202.778	164.889	180.829	548.496
	Improved cattle				
	Crossbred cattle	0.141	2.726	1.763	4.630
	Non descriptive Buffaloes (local low yielding)	6.024	71.283	70.720	148.027
	Descript Buffaloes	6.024	71.283	70.720	148.027
	Goat				242.407
	Sheep				31.371
	Others (Camel, Pig, Yak etc.)				994.648
	Commercial dairy farms (Number)				
1.9	**Poultry**	**No. of farms**	**Total No. of birds ('000)**		
	Commercial		601.160		
	Backyard		12.297		

1.10 **Fisheries** (Data source: Chief Planning Officer)

A. Capture

i) Marine (Data Source: Fisheries Department)	**No. of fishermen**	**Boats**		**Nets**		**Storage facilities (Ice plants etc.)**
		Mechanized	Non-mechanized	Mechanized (Trawl nets, Gill nets)	Non-mechanized (Shore Seines, Stake & trap nets)	

ii) Inland (Data Source: Fisheries Department)	**No. Farmer owned ponds**	**No. of Reservoirs**	**No. of village tanks**
	Govt.	07	

		Pvt.	51		
	B. Culture				
			Water Spread Area (ha)	**Yield (t/ha)**	**Production (‘000 tons)**
	i) **Brackish water** (Data Source: MPEDA/ Fisheries Department)				
	ii) **Fresh water** (Data Source: Fisheries Department)		Govt.-49.2612 Pvt.-0.129		0.166078 0.261000
	Others				

1.11 Production and Productivity of major crops

1.11	**Name of crop**	***Kharif***		***Rabi***		**Summer**		**Total**		**Crop residue as fodder** (‘000 tons)
		Production ('000 t)	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	**Production ('000 t)**	**Productivity (kg/ha)**	
Major Field crops										
	Rice	63.610	1066					63.610	1066	
	Maize	12.251	773			0.0165	1453	12.251	774	
	Pigeonpea	7.523	574					7.523	574	
	Wheat	-	-	66.413	1100			66.413	1100	
	Chickpea			9.298	870			9.298	870	
	Lentil			6.067	646			6.067	646	
Major Horticultural crops										
	Horticulture crops – Fruits									
	Mango					1.700	8000	1.700	8000	

	Guava	3.000	10000					3.000	10000	
	Horticulture crops - Vegetables									
	Potato			18.080	20000			18.080	20000	
	Vegetable pea			5.120	8000			5.120	8000	
	Tomato			11.520	20000			11.520	20000	
	Cauliflower			5.600	20000			5.600	20000	
	Gourd	2.830	10000					2.830	10000	
	Okra	1.875	5000					1.875	5000	

1.12	**Sowing window for 5 major field crops**	**Rice**	**Maize**	**Pigeonpea**	**Chickpea**	**Wheat**
	Kharif- Rainfed	3rd week of June to 1st week of July	4th week of June to 2nd week of July	1st week of July to 4th week of July		
	Kharif-Irrigated	1st week of June to 4th week of June (Nursery)	-	-	-	
	Rabi- Rainfed			-	2nd week of October to 4th week of October	2nd week of October to 4th week of October
	Rabi-Irrigated					2nd week of November to 4th week of November

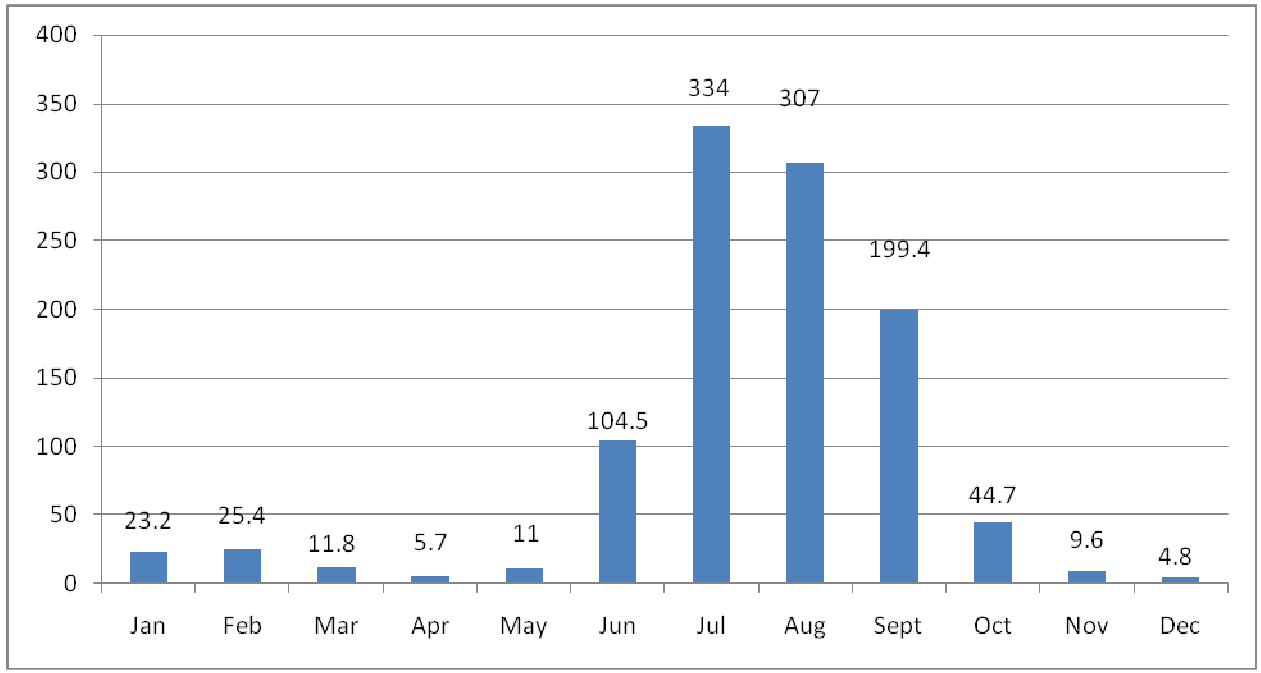
1.13	**What is the major contingency the district is prone to?**	**Regular**	**Occasional**	**None**
	Drought	✓		
	Flood		✓	
	Cyclone			✓

	Hail storm		✓	
	Heat wave		✓	
	Cold wave		✓	
	Frost		✓	
	Sea water intrusion			✓
	Pests and disease outbreak	✓		
	Fog	✓		

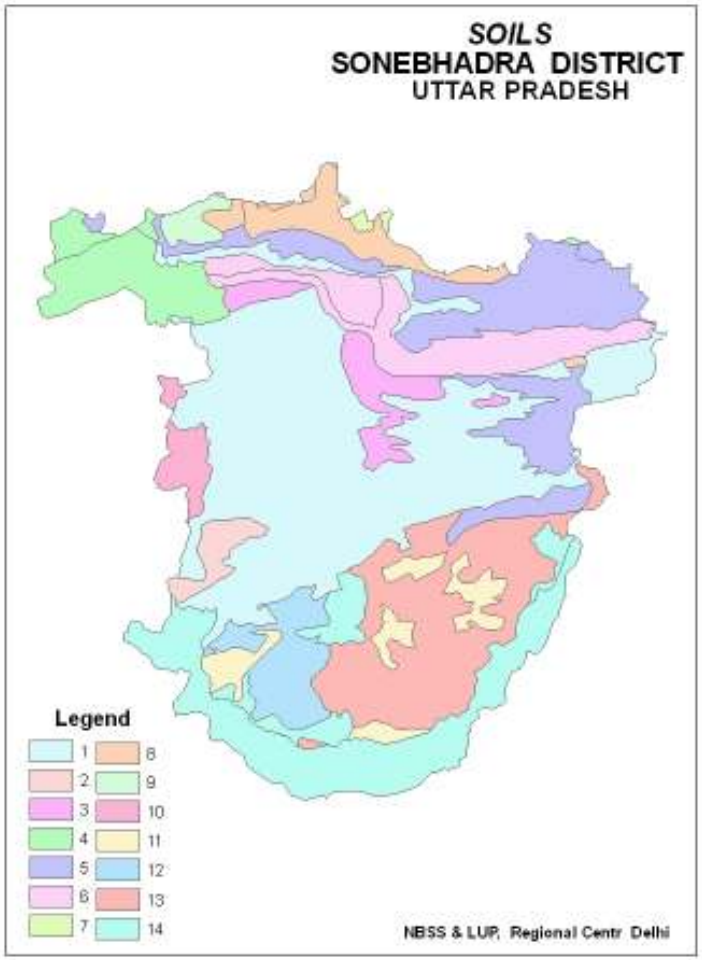
1.14	**Include Digital maps of the district for**	Location map of district within State as Annexure- I	Enclosed: Yes
		Mean annual rainfall as Annexure- II	Enclosed: Yes
		Soil map as Annexure -III	Enclosed: Yes

Annexure-1: Location map of Sonbhadra district within State

Annexure-II: Mean Monthly Rainfall(mm)



Annexure-III



Vindhyan Ranges and Scrap Lands (Sand stone landscape)

Moderately Steep slopes (15-30% slope)

1. Shallow, loamy-skeletal soils and severely eroded associated with rock outcrops
2. Shallow, loamy skeletal soils and severely eroded associated with shallow, loamy-skeletal soils and moderately eroded

Residual Hills (3-5%slope)

3. Rock outcrops; associated with shallow loamy soils, moderately eroded and slight stoniness

Plateau (Sandstone on 1-3% slope)

4. Moderately shallow, loamy soils and moderately eroded
5. Deep, loamy soils and moderately eroded
6. Deep, loamy soils and moderately eroded associated with fine soils and moderately eroded
7. Deep, loamy soils and moderately eroded associated with moderately shallow loamy soils and moderately eroded
8. Deep, fine smectitic soils and moderately eroded associated with moderately shallow loamy soils and moderately eroded
9. Deep, fine smectitic soils and slightly eroded associated with loamy soils, slightly eroded

Soils of Eastern Plateau

Granite-geneissic landscape

Narrow Valley (3-5% slope)

10. Deep, loamy soils and moderately eroded associated with moderately shallow loamy-skeletal soils, severely eroded and strong stoniness

Hills (3-5% slope)

11. Rock outcrops associated with moderately shallow loamy skeletal soils and severely eroded and moderate stoniness

Undulating Uplands (1-3%slope)

12. Moderately shallow, loamy soils, severely eroded and moderately stoniness, associated with, loamy soils, moderately eroded and slight stoniness
13. Deep, fine soils, moderately eroded associated with, loamy soils and moderately eroded
14. Shallow, loamy soils, moderately eroded associated with deep, loamy soils and moderately eroded

2.0 Strategies for weather related contingencies

2.1 Drought

2.1.1 Rainfed situation

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 2 weeks 1st week of July	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Maize- Chickpea Maize-Lentil Maize- Barley Pearl millet- Chickpea Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum – Lentil Sawan- Wheat Sawan- Barley Kondo (Kodo)-Wheat Kondo-Barley Kondo-Chickpea Kondo-Lentil Kondo-Pea Blackgram-Barley Blackgram-Mustard Blackgram-Linseed	Rice/ Maize / Pearl millet/ Sorghum **Rice:** short duration varieties such as Saket-4, Govind & Vandana, Varani Deep, Shushk Samrat, Ashwini & HUR 3022 **Maize:** Malaviya Hybrid Makka-2 Sarataj Prakash Ganga-1Composite- Tarun- Naveen, Kanchan,Shweta, Nav Jyoti, Mahi Kanchan, Prabhat, Azad, Uttam, D-765, Surya & Gaurav **Pearl millet:** WCC 75, Raj 171, Pusa 23 **Sorghum:** CSH-16, CHS-9, CHS-14, CSV-13 &CSV-15	Sowing with seed cum ferti drills and re-sowing if no proper germination. Weed management through dryland weeder & also through weedicides. Thinning of population Conservation furrow Intercultivation Surface water management	Breeder seed may be obtained from the University(NDUAT)/certified seed from NSC Seed drills under RKVY Supply of seeds through NFSM
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame	Intercropping of Pigeonpea + Sesame Pigeonpea Genotypes: Bahar,	Sowing of Pigeonpea + Sesame on ridges Wider spacing of Pigeonpea 90 cm and normal spacing of	

		Pigeonpea+ Sorghum	Narendra Arahar-1, Malviya Vakas(MA-6) & Malviya Chamtkar (MA-13) Sesame: Type- 4, T-12, T-13, Shekhar ,GT-1 ,TC-25 &TC-289	Sesame i. *e.* 30 cm for mono culmed and 45 cm for branched genotypes.	

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 4 weeks 3rd week of July	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	Replace rice with greengram, blackgram and sorghum **Greengram :** Pant Mung -8, PDM-11, Samrat, Jyoti, Jagriti, Janpriya, Jan Chetana and Jan Kalyani **Blackgram:** T-9,Pant Urd-19, Azad-1-2-3, Shekhar-1,2 &3, Pant Urd-31 **Sorghum:** CSH-16, CHS-9, CHS-14, CSV-13 &CSV-15	Resowing of rice crop to have proper germination or gap filling for proper plant stand. Interculture, thinning, conservation furrow. Sowing the crops through seed cum ferti drills Split application of nutrients wherever necessary	Seed drills under RKVY Supply of seeds through NFSM
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea+ Sorghum	Intercropping of Pigeonpea + Sesame/ Greengram/ Blackgram **Pigeonpea: B**ahar, Narendra Arahar-1, Malviya Vakas(MA6) & Malviya Chamtkar (MA13) **Sesame:**Type 4, T-12, T-13, Shekhar ,GT1 ,TC 25 &TC 289 **Greengram :** Pant Mung -8, PDM-11, Samrat, Jyoti, Jagriti, Janpriya, Jan Chetana and Jan Kalyani	Sowing of Pigeonpea + Sesame on ridges Wider spacing of Pigeon pea 90cm and normal spacing of Sesame *i. e.* 30 cm for mono culmed and 45 cm for branched genotypes.	Breeder seed of pigeon pea and greengram can be obtained from the University (B.H.U.) certified seed from NSC.

			Blackgram: Type 9, Pant U 19, Pant U 35, Narendra Urd 1 & Azad Urd-3		

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 6 weeks 1st week of August	Red sandy loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	Replace rice with greengram and pearl millet **Pearl millet**: WCC 75, Raj 171, Pusa 23	Sowing through seed cum ferti drills Wider spacing 25% enhanced nutrients Intercultivation	Seed drills under RKVY Supply of seeds through NFSM
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea+ Sorghum	Intercropping of Pigeonpea + Pearl millet / Greengram **Pigeonpea**: Bahar, Narendra Arahar-1, Malviya Vakas(MA6) & Malviya Chamtkar (MA13) **Sesame:** Type 4, T-12, T-13, Shekhar ,GT1 ,TC 25 &TC 289	Sowing of pigeonpea + intercrops on ridges Wider spacing of Pigeon pea 90cm	Breeder seed of pigeon pea and greengram can be obtained from the University (B.H.U.)

Condition			**Suggested Contingency measures**		
Early season drought (delayed onset)	**Major Farming situation**	**Normal Crop / Cropping system**	**Change in crop / cropping system including variety**	**Agronomic measures**	**Remarks on Implementation**
Delay by 8 weeks	Red Sandy Loam	**Sequence cropping**	Replace rice with Pearl millet	Wider spacing of 45cm	Seed drills under RKVY

3rd week of August	soils Uplands with hillocks	Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	(sole cropping) **Pearl millet** : WCC 75, Raj 171, Pusa 23	Normal population Ridge- furrow sowing	Supply of seeds through NFSM
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea+ Sorghum	Intercropping of Pigeonpea + Pearl millet **Pigeonpea Genotypes:** Bahar, Narendra Arahar-1, Malviya Vakas(MA6) & Malviya Chamtkar (MA13) Sesame : Type 4, T-12, T-13, Shekhar ,GT1 ,TC 25 &TC 289	Sowing of Pigeonpea + Pearl millet on ridges Wider spacing of Pigeon pea at 90cm	Breeder seed of pigeon pea can be obtained from the University (B.H.U.)

Condition			**Suggested Contingency measures**		
Early season drought **(Normal onset)**	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
Normal onset followed by 15-20 days dry spell after sowing leading to poor germination/crop stand etc.	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	Use of drought tolerant rice varieties:NDR 97, Tulsi, Vandana and Govind Shushka Samrat Resowing & gap filling Interrow harrowing	Use of additional N @10kg/ha Conservation furrow	
		Inter cropping system Pigeonpea + Pearl millet	Thinning to maintain proper distance between the plants	Conservation tillage and spray of 2% urea as foliar application	

		Pigeonpea + Sesame Pigeonpea+ Sorghum	**Pigeonpea:** Bahar, Narendra Arahar-1, Malviya Vakas (MA6) & Malviya Chamtkar (MA13) **Sesame** :Type 4, T-12, T-13, Shekhar ,GT1 ,TC 25 &TC 289		

Condition			**Suggested Contingency measures**		
Mid season drought (long dry spell, consecutive 2 weeks rainless (>2.5 mm) period)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At vegetative stage	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	Life saving irrigation if possible Dust/ straw mulch Thinning Intercultivation	Use of additional N @10kg/ha Spray of 2% urea as foliar application Conservation furrow	
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea + Sorghum	Earthing up in main crop, thinning to maintain proper distance between the plants Intercultivation	Conservation tillage Spray of 2% urea as foliar application	

Condition			Suggested Contingency measures		
Mid season drought (long dry spell)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Soil nutrient & moisture conservation measures**	**Remarks on Implementation**
At flowering/ fruiting stage	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea Sorghum- Pea Sorghum - Lentil	Life saving irrigation if possible Dust/ straw mulch Intercultivation Defoliate older leaves Harvesting at physiological maturity	1) Spraying of 2% urea as foliar application 2) KCl Spray	
		Inter cropping system Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea + Sorghum	Life saving irrigation Harvesting of intercrops at physiological maturity Harvesting of Pearl millet & Sorghum crops for fodder purposes	1) Spraying of 2% urea as foliar application 2) KCl Spray	

Condition			Suggested Contingency measures		
Terminal drought (Early withdrawal of monsoon)	**Major Farming situation**	**Normal Crop/cropping system**	**Crop management**	**Rabi Crop planning**	**Remarks on Implementation**
	Red Sandy Loam soils Uplands with hillocks	**Sequence cropping** Rice- Chickpea Rice– Lentil Pearl millet- Chickpea Maize- Chickpea Maize-Lentil Pearl millet- Lentil Pearl millet-Pea Sorghum – Chickpea	Life saving irrigation if possible. Dust/ straw mulch Intercultivation Defoliate older leaves Harvesting at physiological maturity	Sowing of *Toria* in the month of September (Type 9 & Bhawani) Conservation tillage Deep ploughing with rotovater	

		Sorghum- Pea Sorghum - Lentil			
		Inter cropping system Pigeonpea- Pearl millet Pigeonpea- Sesame Pigeonpea- Sorghum	1) Harvesting of intercrop at physiological maturity. 2) Earthing up in main crop 3) Harvesting of Pearl millet & Sorghum crops for fodder purposes. 4) Life saving irrigation to pigeon pea if possible.		

2.1.2 Drought - Irrigated situation

Condition			**Suggested Contingency measures**		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Delayed release of water in canals due to low rainfall	Canal & Bore well-Irrigated Medium to lowland situation	**Sequence Cropping** Rice – Wheat Rice - Pea Rice – Chickpea Rice – Lentil Rice – Mustard	Short duration rice varieties-NDR 97, Ratna, Narendra 118, Narendra 97, Pant Dhan 12, HUR 105, Induri Sambha, HUR 2-1, HUR-3022 to be grown under aerobic condition. Sowing of Sorghum: CSH-16, CHS-9, CHS-14, CSV-13 &CSV-15 on ridges. **Rice :** Early Maturity: Ratna, Narendra 118, Narendra 97, Pant Dhan 12, IR 36, HUR 105, HUR 3022, HUBR 2-1, Induri Sambha; Medium Maturity: Sarju 52, Pant Dhan 4, Narendra 359, PNR 381 *Late* Maturity under low land:Type-3, Basmati 370, Mahsoori, GR-32, Badshabhog, Adamchini	Community nursery Direct seeding in small beds. Use of micro-irrigation systems *viz.* sprinkler & sub-surface irrigation.	Breeder seed will be supplied by BHU and NDAUT, Faizabad. Seed drills RKVY and supply of seeds NFSM
Limited release of water in canals due to low rainfall	Canal & Bore well-Irrigated Medium to lowland situation	**Sequence Cropping** Rice – Wheat Rice - Pea	Grow short duration aerobic rice such as NDR 97, NDR 118, Govind, Vandana, Varanideep, Susk Samrat &	Community nursery, Direct seeding in small beds.	Breeder seed will be supplied by BHU and NDAU, Faizabad.

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
		Rice – Chickpea Rice – Lentil Rice – Mustard	HUR 105 **Maize :**Malviya hybrid Makka-2, Naveen & Jaunpuri **Pearl millet:** WCC 75, Raj 171, Pusa 23 **Sorghum:** CSH-16, CHS-9, CHS-14, CSV-13 &CSV-15 should be grown on ridges for fodder/grain purposes. **Rice genotypes:** Early Maturity: Ratna, Narendra 118, Narendra 97, Pant Dhan 12, IR 36, HUR 105, HUR 3022, HUBR 2-1, Induri Sambha; Medium Maturity: Sarju 52, Pant Dhan 4, Narendra 359, PNR 381 Late Maturity under low land:Type-3, Basmati 370, Mahsoori, GR-32, Badshabhog, Adamchini	Use of micro-irrigation systems *viz.* sprinkler & sub-surface irrigation.	Seed drills RKVY and supply of seeds NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Non release of water in canals under delayed onset of monsoon in catchment	Canal & Bore well-Irrigated Medium to lowland situation	**Sequence Cropping** Rice – Wheat Rice - Pea Rice – Chickpea Rice – Lentil Rice – Mustard	Rice may be replaced by pulses **Greengram –** Pant Mung -8, PDM-11, Samrat, Jyoti, Jagriti, Janpriya, JanChetana & Jan Kalyani, **Blackgram -**Type 9, Pant U 19, Pant U 35, Narendra Urd 1 & Azad Urd-3	Direct seeding in small beds. Use of micro-irrigation systems *viz.* sprinkler & sub-surface irrigation.	Breeder seed will be supplied by BHU and NDAUT, Faizabad. Seed drills RKVY and supply of seeds NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			Oil seeds: **Sesame –**Type 4, T-12, T13,Shekhar, GT1, TC 25 &TC 28 Vegetables :Cowpea/ Bhendi/ Brinjal/ Chillies		
		Intercropping	**Inter cropping of** Pigeonpea + Sesame Pigeonpea + Blackgram Pigeonpea + Greengram Pigeonpea + Sorghum Pigeonpea + Pearl millet	Sowing of Pigeonpea at 90 cm + two rows of intercrops on ridges	Breeder's seed may be obtained from BHU & Faizabad. Ridger from RKVY

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Lack of inflows into tanks due to insufficient /delayed onset of monsoon	Canal & Bore well-Irrigated Medium to lowland situation	**Sequence Cropping** Rice – Wheat Rice - Pea Rice – Chickpea Rice – Lentil Rice – Mustard	**Rice genotypes:** (*Early Maturity*: Ratna, Narendra 118, Narendra 97, Pant Dhan 12, IR 36, HUR 105, HUR 3022, HUBR 2-1, Induri Sambha; *Medium Maturity*: Sarju 52, Pant Dhan 4, Narendra 359, PNR 381 *Late Maturity under low land*:Type-3, Basmati 370, Mahsoori, GR-32, Badshabhog, Adamchini) Grow fodder crops such as **Cowpea :**Russian Giant, UPC 5286, UPC 5287, NP 3 **Sorghum :**PC 6, PC 9, UP *Chari*-1 &2, Pant *Chari*-3, HC 308 & Haryana *Chari* 171 **Maize:** (*Desi* (T 41) Hybrid	Conservation tillage. Sowing of Pearl millet & Sorghum for grain purposes at a spacing of 45 cm on ridges. 2% of foliar application of Urea at vegetative stage. Use of mulches (straw/dust).	Breeder's seed will be supplied by BHU and NDAUT, Faizabad. Seed drills RKVY and supply of seeds NFSM

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
			Ganga -2, 5 & 7 and Composites – Kissan, African Tall & Vijay) & **Pearl millet :**Gaint Bajra, Raj Bajra-2 Grow **Pearl millet** (WCC 75, Raj 171, Pusa 23**)** for grain purpose.		
		Intercropping	Pigeonpea + Pearl millet Pigeonpea + Sesame	Conservation tillage – ridge furrows. Use of mulches (straw & dust both).	

Condition			Suggested Contingency measures		
	Major Farming situation	**Normal Crop/cropping system**	**Change in crop/cropping system**	**Agronomic measures**	**Remarks on Implementation**
Insufficient groundwater recharge due to low rainfall	Canal & Bore well-Irrigated Medium to lowland situation	**Sequence Cropping** Rice – Wheat Rice - Pea Rice – Chickpea Rice – Lentil Rice – Mustard	Rice should be replaced by pulses (green gram & black gram), oilseeds (Sesame) in *Kharif* and wheat by greengram & lentil in *Rabi* season.	Direct seeding in small beds. Use of micro-irrigation systems *viz.* sprinkler & sub-surface irrigation.	Breeder's seed will be supplied by BHU and NDAUT, Faizabad. Seed drills RKVY and supply of seeds NFSM
		Intercropping	Pigeonpea + Pearl millet Pigeonpea + Sesame Pigeonpea + Sorghum	Conservation tillage – ridge furrows. Use of mulches (straw & dust both).	

2.2: Unusual rains (untimely, unseasonal etc) (for both rainfed and irrigated situations)

Condition	Suggested contingency measures			
Continuous high rainfall in a short span leading to water logging	**Vegetative stage**	**Flowering stage**	**Crop maturity stage**	**Post harvest**

Wheat	Provide drainage	Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Rice	Provide drainage	Proper bunding Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Maize	Provide drainage and Practice of sowing on ridges	Make inter-row furrow to Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Pigeonpea	Provide drainage and Practice of sowing on ridges	Make inter-row furrow to Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Chickpea	Provide drainage	Drain out excess water	Harvesting at physiological maturity	Shift to safer place
Horticulture vegetable				
Potato	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Shift to safer place
Onion	-	-	Drain out excess water	Shift to safer place
Tomato	Drain out excess water Sow on ridges	Drain out excess water	Drain out excess water	Shift to safer place
Cauliflower	Drain out excess water Sow on ridges	Drain out excess water	Drain out excess water	Shift to safer place
Vegetable Pea	Drain out excess water Sow on ridges	Drain out excess water	Drain out excess water	Shift to safer place
Heavy rainfall with high speed Winds in short span				
Wheat	Drain out excess water	Drain out excess water and speed of wind may be protected with vegetable barriers	Drain out excess water and protect with vegetable barriers from wind	Keep the grains at safer place
Rice	Drain out excess water	Drain out excess water protected with vegetable barriers	Drain out excess water and protect with vegetable barriers from wind	Keep the grains at safer place
Maize	Drain out excess water sowing on ridges	Drain out excess water sowing on ridges	Drain out excess water. Harvesting at physiological maturity (Cob stage)	Keep the grains at safer place
Pigeonpea	Drain out excess water sowing on ridges	Make inter-row furrow to drain out excess water	Drain out excess water through furrows	Keep the grains at safer place
Chickpea	Drain out excess water	Drain out excess water	Drain out excess water and tie the plants amongst them	Keep the grains at safer place

Horticulture (Vegetable Crops)				
Potato	Drain out excess water	Drain out excess water	Drain out excess water	Shift to safer place
Onion	-	-	Drain out excess water	Shift to safer place
Tomato	Drain out excess water Sow on ridges	Drain out excess water protected with vegetable barriers	Drain out excess water protected with vegetable barriers	Shift to safer place
Cauliflower	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Shift to safer place
Vegetable Pea	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Drain out excess water Sow on ridges	Shift to safer place
Outbreak of pests and diseases due to unseasonal rains				
Wheat	-do	-do	-do	-do
Rice	Need based plant protection (integrated pest and disease management)	Need based plant protection (integrated pest and disease management	Need based plant protection (integrated pest and disease management	Safe storage against stored grain pest and diseases
Maize	-do	-do	-do	-do
Pigeonpea	-do	-do	-do	-do
Chickpea	-do	-do	-do	-do
Horticulture (Vegetable Crops)	-do-	-do-	-do-	-do-
Potato	-do-	-do-	-do-	-do-
Onion	-do-	-do-	-do-	-do-
Tomato	-do-	-do-	-do-	-do-
Cauliflower	-do-	-do-	-do-	-do-
Vegetable Pea	-do-	-do-	-do-	-do-

2.3 Floods

Condition	**Suggested contingency measure**			
Transient water logging/ partial inundation	**Seedling / nursery stage**	**Vegetative stage**	**Reproductive stage**	**At harvest**
Rice	Early maturing variety should be preferred	Provide drainage	Provide drainage Prevent premature seed	Harvesting at physiological maturity

			germination	Shift produce to safer place Provision for buying / marketing of discoloured grain at the earliest to provide relief
Maize	Drain out excess water	Drain out excess water	Drain out excess water	Harvesting at physiological maturity
Pigeonpea	Drain out excess water	Drain out excess water	Drain out excess water	Harvesting at physiological maturity
Continuous submergence for more than 2 days				
Rice	Varieties having submergence resistance should be grown *viz.* Swarana sub-1, IR-64 sub-1 Community nursery	Re transplanting after cessation of flood from community nursery.	Prevent premature seed germination Plan for early rabi	Harvesting at physiological maturity
Maize	Replace by submerged rice varieties *viz.* Swarana sub-1, IR-64 sub-1.	Replace by submerged rice varieties *viz.* Swarana sub-1, IR-64 sub-1.	-	-
Pigeonpea	Replace by submerged rice varieties *viz.* Swarana sub-1, IR-64 sub-1.	Replace by submerged rice varieties *viz.* Swarana sub-1, IR-64 sub-1.	-	-
Sea water intrusion	Not applicable			

2.4 **Extreme events: High temperature (heat wave) / Cold wave/Frost/ Hailstorm /Cyclone/Fog**

Extreme event type	**Suggested contingency measure[r]**			
	Seedling / nursery stage	**Vegetative stage**	**Reproductive stage**	**At harvest**
Heat Wave				
Wheat	-	-	Provide irrigation during stress	Harvesting at physiological

			along with growing heat resistant varieties (stay green colour varieties) Foliar application of 2% urea	maturity
Rice	Provide irrigation	Proper irrigation during stress period along with growing heat resistant varieties Foliar application of 2% urea	-	-
Maize	-	Proper irrigation	-	-
Pigeonpea	Conservation tillage - ridges & furrows	Conservation tillage - ridges & furrows	Heat tolerant varieties should be grown, light irrigation	Harvesting at physiological maturity
Chickpea	-	-	Heat tolerant varieties should be grown, light irrigation	Harvesting at physiological maturity
Horticulture (Vegetable Crops)				
Potato	Provide irrigation	Provide irrigation	Provide irrigation	Provide irrigation
Onion	Provide irrigation	Provide irrigation	Provide irrigation	Provide irrigation
Tomato	Provide irrigation	Provide irrigation	Provide irrigation	Provide irrigation
Cold wave				
Wheat	-	Proper irrigation through out stress along with growing cold tolerant varieties	Proper irrigation through out stress along with growing cold tolerant varieties	Proper irrigation through out stress along with growing cold tolerant varieties
Pigeonpea	-	-	Proper irrigation & growing cold tolerant varieties	-
Chickpea	-	Proper irrigation through out stress along with growing cold tolerant varieties	Proper irrigation through out stress along with growing cold tolerant varieties	Proper irrigation through out stress along with growing cold tolerant varieties
Horticulture (Vegetable Crops)				
Potato	-	Provide irrigation	Provide irrigation	-

Tomato	-	Provide irrigation	Provide irrigation	-
Cauliflower	-	-	Keep the surroundings warm(burning the waste materials) & growing cold tolerant varieties	Harvest the crop at pre-mature stage
Vegetable Pea	-	-	Keep the surroundings warm(burning the waste materials) & growing cold tolerant varieties	Harvest the crop at pre-mature stage
Frost				
Wheat	-	Tolerant/resistant varieties should be grown	Tolerant/resistant varieties should be grown	-
Pigeonpea	-	Tolerant/resistant varieties should be grown	Tolerant/resistant varieties should be grown	Tolerant/resistant varieties should be grown
Chickpea	-	Tolerant/resistant varieties should be grown	Tolerant/resistant varieties should be grown	-
Horticulture (Vegetable Crops)				
Cauliflower	-	-	Resistant varieties should be grown	Pre-mature harvest
Vegetable Pea	-	-	Resistant varieties should be grown	Pre-mature harvest
Hailstorm				
Wheat	Resowing of crop with suitable late sowing varieties *viz.* HUW 234, UP 2425, K 9162, Triveni.	Replace wheat by Vegetable crops such as Onion.	Harvest for fodder purpose and sowing Greengram.	Harvest at Physiological maturity and keep at safer palce.
Pigeonpea	-	-	Harvest for fodder purpose.	Harvest at Physiological maturity and keep at safer place.
Chickpea	Resowing of crop with suitable late sowing varieties *viz.* Pusa 372, PGD 84-10, Uday, Pant G186	Replace gram by Vegetable crops such as Onion.	Harvest for vegetable purpose and sowing Green gram after the harvest.	Harvest at Physiological maturity and keep at safer place.

Horticulture				
Potato	Resowing	Resowing	-	-
Tomato	Replanting	Replanting/Gap filling	-	Pre-mature plucking
Cauliflower	-	-	Pre-mature harvest	Pre-mature harvest
Vegetable Pea	-	-	Pre-mature harvest (Greenpod)	Pre-mature harvest (Greenpod)
Cyclone	Not applicable			

2.5 Contingent strategies for Livestock, Poultry & Fisheries

2.5.1 Livestock

	Suggested contingency measures		
	Before the events	**During the event**	**After the event**
Drought			
Feed and fodder availability	Insurance Encourage perennial fodder on bunds and waste land on community basis Establishing fodder banks, encouraging fodder crops in irrigated area Silage – using excess fodder for silage	Utilizing fodder from perennial trees and Fodder bank reserves. Utilizing fodder stored in silage. Transporting excess fodder from adjoining districts Use of feed mixtures. Allow the cattle's for grazing at barren lands.	Availing Insurance
Drinking water	Preserving water in the tank for drinking purpose Excavation of Bore wells	Using preserved water in the tanks for drinking. Wherever ground water resources are available priority for drinking purpose.	
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	
Floods			
Feed and fodder availability	Grow the fodder crops at safer places (non- flood prone area)	Utilizing fodder from perennial trees and Fodder bank reserves. Utilizing fodder stored in silage.	Availing insurance

		Transporting excess fodder from adjoining districts Use of feed mixtures. Shift the live stocks at safer place.	
Drinking water		Shift the live stocks at safer place where drinking water is available.	
Health and disease management	Veterinary preparedness with medicines and vaccines	Conducting mass animal Health Camps and treating the affected once in Campaign	
Cyclone			
Feed and fodder availability			
Drinking water			
Health and disease management			
Heat wave and cold wave			
Shelter/environment management			
Health and disease management			

2.5.2 Poultry

	Suggested contingency measures			**Convergence/linkages with ongoing programs, if any**
	Before the event	**During the event**	**After the event**	
Drought	Insurance & Integration Establishing feed reserve Bank	Utilizing from feed reserve banks	Availing insurance Strengthening feed reserve Banks	
Shortage of feed ingredients				

Drinking water				
Health and disease management	Emergency Veterinary preparedness with medicines vaccination to birds	Campaign and Mass Vaccination	Culling affected birds	
Heat wave and cold wave				
Shelter/environment management				
Health and disease management				

2.5.3 Fisheries/ Aquaculture

	Suggested contingency measures		
	Before the event	**During the event**	**After the event**
1) Drought			
A. Capture			
Marine			
Inland			
(i) Shallow water depth due to insufficient rains/inflow			
(ii) Changes in water quality			
(iii) Any other			
B. Aquaculture			
(i) Shallow water in ponds due to insufficient rains/inflow			
(ii) Impact of salt load build up in ponds / change in water quality			
(iii) Any other			

2) Floods			
A. Capture			
Marine			
Inland			
(i) No. of boats / nets/damaged			
(ii) No.of houses damaged			
(iii) Loss of stock			
(iv) Changes in water quality			
(v) Health and diseases			
B. Aquaculture			
(i) Inundation with flood water			
(ii) Water contamination and changes in water quality			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, huts etc)			
(vi) Any other			
3. Cyclone / Tsunami			
A. Capture			
Marine			
(i) Average compensation paid due to loss of fishermen lives			
(ii) Avg. no. of boats / nets/damaged			
(iii) Avg. no. of houses damaged			
Inland			

B. Aquaculture			
(i) Overflow / flooding of ponds			
(ii) Changes in water quality (fresh water / brackish water ratio)			
(iii) Health and diseases			
(iv) Loss of stock and inputs (feed, chemicals etc)			
(v) Infrastructure damage (pumps, aerators, shelters/huts etc)			
(vi) Any other			
4. Heat wave and cold wave			
A. Capture			
Marine			
Inland			
B. **Aquaculture**			
(i) Changes in pond environment (water quality)			
(ii) Health and Disease management			
(iii) Any other			